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## RECENT LITERATURE.

A JOURNAL OF A TOUR IN MAROCCO AND THE GREAT ATLAS.<sup>1</sup>—Naturalists, and especially botanists, cannot soon forget the delight with which they perused the volumes of the Himalaya Journals. Indeed there is a grace of style, a closeness of observation and an accuracy of statement in Sir Joseph Hooker's writings which claim the attention and interest even of the general reader. His account of his journey to Marocco, in 1871, has been anticipated with delight by all readers of his former travels, nor will they be disappointed when they take up the volume before us.

Owing to Sir Joseph Hooker's pressing engagements as Director of Kew Gardens and President of the Royal Society, there has been unavoidable delay in the publication of the journal; indeed, at his own request, Mr. John Ball, who accompanied him in the journey, completed the work after the first two chapters. No one, however, will regret this, for Mr. Ball is certainly a good writer and close observer, not hesitating to relieve his narrative now and then by humorous comments on men and things. It is stated by the authors that owing to the peculiar condition of Marocco (which it will be observed they spell with an *a*) no great change has probably occurred in that country since their visit, and hence the delay in publication is of less consequence than would usually be the case.

"The narrative now published is mainly founded on the journals kept by Sir J. Hooker and Mr. Ball, supplemented in some particulars by that of their fellow traveler, Mr. G. Maw."

The desire of the distinguished party was to penetrate the Atlas range and to determine some vexed points of geography while collecting the plants of this almost unknown region. Although provided with the order of the Sultan to allow them all possible privileges, they were constantly thwarted in their desires by the fanaticism and suspicions of local governors and petty chiefs. The Sultan's letter, it is true, did not appear to give very explicit directions, and to the mind of the reader, at least, leaves that sovereign open to the suspicion of chicanery: "On receiving this, you will send the English hakeem and his companions to the care of my slave, El Graoni, to whom I have sent orders what he is to do." Judging from after developments, the slave, who was a powerful chief, read freely between the lines. The party succeeded, however, on one occasion, in escaping from the surveillance of the guides and actually reaching the much-coveted snow. We quote the graphic account of this ascent:

"Much to our satisfaction the sheik now withdrew, committing us to the charge of an active but unarmed young Shelluh, with

<sup>1</sup> *Journal of a Tour in Marocco and the Great Atlas.* By Sir J. D. HOOKER and JOHN BALL. London, Macmillan & Co., 1878. \$6.50.

strict injunctions to lead us as far as the snow, but not to allow us to proceed farther. It is hard to say whether the sheik and his people felt any real uneasiness as to the possibility of a casual encounter with natives of the Sous valley; but it was pretty clear that they had succeeded in frightening our attendants, as our Mogador men, usually so active and attentive, soon dropped behind and were not again seen till our return in the afternoon. We took the most direct course in the ascent, following a slight gully down which flowed a mere trickling rivulet, fed by the snows on the upper slope of the mountain, and pushed on rather fast with a view to get as high on the mountain as possible before the sun reached the meridian.

"Bearing in mind the great diversity in the vegetable population which is seen in Southern Spain (the high mountain region nearest to the great Atlas), where neighboring peaks of different mineral structure exhibit numerous quite distinct species, and very few identical features, and having found the flora of the lower valley to a great extent different from that of Aït Mesan, we confidently reckoned on obtaining still greater evidence of distinctness in that of the upper region. It was, therefore, with some surprise that, as we continued the ascent, we met, one after another, many of the peculiar species that we had first seen in the ascent from Arround to the Tagherot pass, and comparatively few not already familiar to us. For once, however, it must be owned that during part of this day, our emotions as botanists yielded to the interest that we felt in the near prospect of a peep into *terra incognita*. If but little had hitherto been known of the northern slopes of the Great Atlas from the reports of the few travelers who had viewed the range from the low country, or had attained its outer slopes, the southern side of the main chain remained a sealed book to the geographers, whose reliance on the vague reports of native informants has led them, like the cartographers of the middle ages, to fill up the blank space on their maps by representations utterly discordant and contradictory. \* \* Of the physical features of the country we could learn nothing.

"By the time we reached the lower skirts of a long snow slope that stretched upwards towards the summit of the mountain, the sun, which had now ascended nearly to the zenith, beat down upon us with intense rays, that drove some of the party to seek temporary shelter. The guide probably considering that he had done his day's work, and finding a narrow rim of shadow under an overhanging rock, lay down with his head screened from the blazing heat. Ball, who was suffering from a violent headache, also found a spot that gave partial shade. Hooker took advantage of the halt to push on at a steady pace that soon carried him beyond the reach of interference from the guide. When Ball felt able to resume the ascent, the guide sprung to his feet, and

for the first time became aware that one of the party was already too far ahead to be easily overtaken. He proceeded, by a series of unearthly yells and frantic gesticulations, to attempt to attract Hooker's attention, and urge him to return. When these demonstrations were found to be useless, and he perceived that Ball was also about to follow in the ascent, he commenced a fresh series of exclamations and pantomimic gestures, of which the burden seemed to be that if we went we were certain to be shot; but the same argument that was used with effect on the Tagherot pass—the gift of a silver coin—was so far successful that no attempt was made to arrest Ball's progress, and after ascending a few hundred feet higher, the unwilling guide gave up the attempt, and rested comfortably until he had an opportunity of rejoining Hooker in his descent. \* \* \*

"Hooker reached the summit about 2 P. M., and was rejoined by Ball nearly half an hour later. Excepting some light fleecy cumuli floating over the low country to the north, at a lower level than the eye, the sky was cloudless; but in some directions a thin haze obscured the details of the vast panorama. Our first glance was inevitably directed towards the unknown region to the south, and there, at a distance of fifty or sixty miles, rose the range of Anti-Atlas, showing a wavy outline, with rounded summits, and no apparent deep depression, rising, as we estimated, to a height of from 9000 to 10,000 feet above the sea."

Full as the work is with graphic pictures, it is to the botanist, of course, that it will afford the most delight. Not only are plants described, but their habits and distribution are noted, as for instance when the authors speak of *Periploca græca* and *P. lævigata*. The latter is the single mainly western species, "This appears to be common in the Canary islands, and grows freely in the tract now visited by us to the north-west of Mogador. It has been found in abundance on some rocky islands near the coast of Sicily; but in spite of the silky hairs attached to the seeds, it has not spread itself to neighboring islands, nor to the Sicilian coast. It has been detected in two or three places in the south-east of Spain, and here and there in rocky places on the skirts of the desert in the interior of Algeria and Tunis. Finally, it was long ago found by Labillardière in one place on the coast of Syria. All this points to the former wide diffusion of a plant which no longer finds favorable conditions of existence, unless, perhaps, in the Canary islands. Its presence in the interior of North Africa may possibly date from the period when it grew near the coast of a great gulf opening to the Atlantic; but it is not easy to understand how it has held its ground in a climate so different from that of its natural home. This plant has inherited from a remote ancestor a habit which is now of no service to it. The young branches near the root twine round any adjacent support, but as they grow older they become stiff and straight, and

the taller specimens derive no adventitious support from this source."

A copious appendix at the end of the volume, which, by the way, is neatly illustrated, embodies, together with much other matter, valuable notes on the flora of Morocco and the Canaries, together with meteorological and geological information in a condensed form. We take pleasure in commending the work to our readers, feeling sure that it will meet with their approval.—*W. W. B.*

THE SERIES OF ANIMAL FORMS IN GEOLOGICAL TIME.<sup>1</sup>—In this work Prof. Gaudry brings together from his stores of palæontological knowledge the evidences of serial relation in time presented by various groups of *Mammalia*. Following in the steps of Kowalevsky (*Palæontographica*, 1873) and Cope (*Journal Philadelphia Academy Sciences*, 1874), he takes up the history of each portion of the skeleton separately, and although he does not exhaust the subject, he treats it more fully than either of the authors named. The volume is divided in correspondence to the orders of *Mammalia*, and in each division the characters of the skull and skeleton, of the feet and of the teeth are taken up successively. Prof. Gaudry's classification, it must be admitted, is somewhat antiquated, for he adopts the "orders" *Pachydermata* and *Solipeda*, including in the former the hogs. Under the *Marsupialia* he describes the interesting French genera of the *Creodonta*, giving excellent figures of their teeth, which are very welcome. He does not appear to have been acquainted with the researches of Cope on these animals published in 1875<sup>2</sup> in which it was shown that they cannot be referred with any probability to the marsupials. Under the head of *Pachydermata* an interesting discussion of the origin of the present dental type of the *Rhinoceri* is found, that part relating to the outer crests of the molars being apparently new. The portion relating to *Palæotherium* and *Lophiodon* is especially useful. Prof. Gaudry treats the *Amblypoda* lightly, the principal expositions of the characters of the order by American palæontologists not having probably come into his hands at the time of writing his book. The discussion of the teeth and feet of *Ruminantia* is especially full, and good figures of the parts of several genera little known in America are given. One of the best chapters is that on the *Carnivora*, where the gradations in the dental characteristics of the genera are clearly shown. The extinct *Quadrumana* of Europe are very well illustrated, including the genera of *Mesodonta*, found in France. The author admits the suggestion of Filhol, that the latter "présentent, comme les *Adapis*, des passages entre les lémuriens et les pachydermes" (p. 230); a position which we

<sup>1</sup> *Les Enchaînements du Monde Animal dans les Temps Géologiques. Mammifères Tertiaires.* Par ALBERT GAUDRY. Paris, Savy, 1878. 8vo.

<sup>2</sup> Proceedings Academy of Natural Sciences, Philadelphia, December.